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10/608,074

06/30/2003

Dong-Hyun Kim

253/031

7847

27849

7590

10/10/2006

LEE & MORSE, P.C.

3141 FAIRVIEW PARK DRIVE

SUITE 500

FALLS CHURCH, VA 22042

EXAMINER

HUSBAND, SARAH E

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,074

Applicant(s)

KIM ET AL.

Examiner

Sarah E. Husband

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 and 22-32 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of Species I (claims 1-13 and 22-32) in the reply filed on 7/20/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the fourth plurality of nozzles as described in the specification and claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as

either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 6, 7, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsuno (US Patent No. 6,874,516).

Matsuno discloses a wafer cleaning apparatus having a plurality of holders securing the edge of the wafer and rotating (Item 8), a first plate facing a first surface having a plurality of first nozzles (Item 13, Fig. 8B, 9A, 15A) and a second plate facing a second surface and having a plurality of second nozzles (Item 15, Fig. 12; col. 8). Matsuno also discloses the passages connecting the nozzles and cleaning solution (Fig. 12). Matsuno further discloses the plurality of holders and the grooves within the holders (Fig. 3a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1746

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno in view of Datta (US Patent No. 6103096).

Matsuno discloses the apparatus in the 102(e) rejection. Matsuno does not specifically disclose the diameter of the nozzles decreasing as approaching the edge of the wafer. Datta discloses the nozzles can vary in size having a larger diameter at the center to a smaller diameter at the edges to better compensate for edge effects (col. 5, ll. 3-10). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno with Datta for the benefit of better processing of the wafer edges.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno in view of Trinh (US Patent No. 5,779,816).

Matsuno discloses the wafer cleaning apparatus in the 102(e) rejection. Matsuno does not specifically disclose the nozzle cross-section increasing toward the wafer. Trinh discloses the nozzle cross-section increasing toward the wafer in wafer cleaning procedures. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno with Trinh for the benefit of increased flow rate and therefore better cleaning (abstract).

Claim 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno in view of Boumerzoug (US Patent No. 6,764,385).

Matsuno discloses the apparatus in the 102(e) rejection, but does not disclose the angled nozzles and separate gas drying nozzles. Matsuno does disclose the plurality of gas drying nozzles which can also function as liquid nozzles. Boumerzoug discloses nozzles angling away from the center. Boumerzoug also discloses a separate gas drying nozzle. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno with Boumerzoug for the benefit of aiding in the removal of surface particles and also avoiding fluid contamination.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno in view of Husain (US Patent No. 6,516,816).

Matsuno discloses the apparatus shown above in the 102(e) rejection, but does not disclose the grooves having drain holes. Husain discloses the drain holes present in the wafer holders (Fig. 5C, Item 413; col. 5). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno with Husain for the benefit of removing the fluid from the wafer.

Claims 22-27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno in view of Okamoto (JP 2001009387).

Matsuno discloses the apparatus in the above 102(e) rejection, but does not disclose the first driving part or second driving part rotating the first and second plates in a direction opposite to the wafer. Okamoto discloses the top and bottom plates rotating in a different direction than the wafer. Although the drive sources are not shown, it is apparent that the apparatus parts could not rotate without a driving mechanism and would be inherently

present. It would also be inherent that there would be a driving part which controlled the access to the wafer. The top plate or bottom plate must be movable to have this access and also the wafer holders must be able to be separated from the wafer. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno with Okamoto for the benefit of accurately controlling the cleaning action.

Claims 28, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuno and Okamoto as applied to claims 22-27, 29 and 30 above, and further in view of Kamikawa (US Patent No. 5,862,823).

Matsuno and Okamoto disclose the apparatus shown above in the 103(a) rejection. They do not disclose the ball screw, ball guide or ball block. Kamikawa discloses that it is known to use this type of drive to move semiconductors vertically (col. 6, ll. 4-15). Kamikawa also discloses a transferring robot, which are common in the art. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Matsuno and Okamoto with the drive structure shown by Kamikawa as it is a known way to provide vertical movement in the semiconductor art.

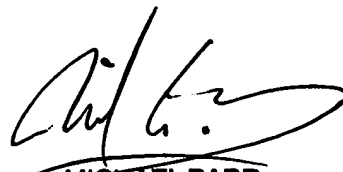
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah E. Husband whose telephone number is (571) 272-8387. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael E. Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SEH



MICHAEL BARR
SUPERVISORY PATENT EXAMINER